

In re Patent Application of:

CAIN

Serial No. **10/043,457**

Filing Date: **JANUARY 10, 2002**

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In the Claims:

Claims 1-52 (Cancelled).

53. (New) A wireless communication network comprising:

a plurality of mobile nodes each comprising a transceiver, a phased array antenna connected to said transceiver, and a controller connected to said transceiver for

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots and with one of the semi-permanent time slots being scheduled as an available time slot if a number of the communication links is less than N,

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand, and

aiming said phased array antenna toward each neighboring mobile node during communication therewith.

54. (New) A wireless communication network according to Claim 53, wherein said controller prioritizes the communication links and schedules the at least one available time slot based upon the prioritization.

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55. (New) A wireless communication network according to Claim 53, wherein said controller reschedules the assigned time slot back to a semi-permanent time slot if the number of the communication links is to be equal to N.

56. (New) A wireless communication network according to Claim 53, wherein each mobile node further comprises an omni-directional antenna connected to said transceiver for exchanging positional information with other neighboring mobile nodes.

57. (New) A wireless communication network according to Claim 53, wherein a plurality of communication links are established within a scheduled semi-permanent time slot, with each communication link including a different pair of neighboring mobile nodes.

58. (New) A wireless communication network comprising:

a plurality of mobile nodes each comprising a transceiver, a phased array antenna connected to said transceiver, and a controller connected to said transceiver for

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots,

scheduling the at least one available time slot to also serve the communication link with a

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neighboring mobile node based upon link communications demand,

aiming said phased array antenna toward each neighboring mobile node during communication therewith, and

prioritizing the communication links and dropping one of the communication links based upon the prioritization for making available a semi-permanent time slot for establishing a communication link with a new neighboring mobile node.

59. (New) A wireless communication network according to Claim 58, wherein a plurality of communication links are established within a scheduled semi-permanent time slot, with each communication link including a different pair of neighboring mobile nodes.

60. (New) A wireless communication network comprising:

a plurality of mobile nodes each comprising a transceiver, a phased array antenna connected to said transceiver, and a controller connected to said transceiver for

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots,

scheduling the at least one available time slot to also serve the communication link with a

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neighboring mobile node based upon link
communications demand, and

 aiming said phased array antenna
toward each neighboring mobile node during
communication therewith; and

each communication link being formed by an
initiating mobile node and a receiving mobile node, and said
initiating mobile node transmitting a list of available semi-
permanent time slots to said receiving mobile node.

61. (New) A wireless communication network
according to Claim 60, wherein said receiving mobile node
transmits selection of one of the semi-permanent time slots to
said initiating mobile node.

62. (New) A wireless communication network
according to Claim 61, wherein said initiating mobile node
confirms selection of the selected semi-permanent time slot to
said receiving mobile node.

63. (New) A wireless communication network
comprising:

 a plurality of mobile nodes, each mobile node
comprising a phased array antenna and a plurality of
transceivers connected thereto so that said phased array
antenna simultaneously generates multiple antenna beams, and a
controller connected to said plurality of transceivers for
 scheduling a respective semi-permanent time
slot for each time frame to establish a
communication link with each neighboring mobile

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node, each time frame having up to N semi-permanent time slots and at least 2N-1 available time slots,

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand, and

aiming said phased array antenna to multiple neighboring mobile nodes within a scheduled semi-permanent time slot.

64. (New) A wireless communication network according to Claim 63, wherein the multiple antenna beams are generated on different frequencies.

65. (New) A wireless communication network comprising:

a plurality of mobile nodes each comprising a transceiver, a directional antenna connected to said transceiver, and a controller connected to said transceiver for

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node and leaving at least one available time slot in each time frame,

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand,

aiming said directional antenna toward each

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neighboring mobile node during communication therewith, and

prioritizing the communication links and dropping one of the communication links based upon the prioritization for making available a semi-permanent time slot for establishing a communication link with a new neighboring mobile node.

66. (New) A wireless communication network according to Claim 65, wherein each time frame has up to N semi-permanent time slots and at least $2N-1$ available time slots.

67. (New) A wireless communication network according to Claim 65, wherein said controller prioritizes the communication links and schedules the at least one available time slot based upon the prioritization.

68. (New) A wireless communication network according to Claim 65, wherein each communication link is formed by an initiating mobile node and a receiving mobile node, and wherein said initiating mobile node transmits a list of available semi-permanent time slots to said receiving mobile node.

69. (New) A wireless communication network according to Claim 68, wherein said receiving mobile node transmits selection of one of the semi-permanent time slots to said initiating mobile node.

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70. (New) A wireless communication network according to Claim 69, wherein said initiating mobile node confirms selection of the selected semi-permanent time slot to said receiving mobile node.

71. (New) A wireless communication network according to Claim 65, wherein each mobile node further comprises an omni-directional antenna connected to said transceiver for exchanging positional information with other neighboring mobile nodes.

72. (New) A wireless communication network according to Claim 65, wherein a plurality of communication links are established within a scheduled semi-permanent time slot, with each communication link including a different pair of neighboring mobile nodes.

73. (New) A wireless communication network comprising:

a plurality of mobile nodes each comprising a transceiver, a directional antenna connected to said transceiver, and a controller connected to said transceiver for

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node and leaving at least one available time slot in each time frame, and with one of the semi-permanent time slots being scheduled as an available time slot if a number of the communication links is less than N,

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scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand, and aiming said directional antenna toward each neighboring mobile node during communication therewith.

74. (New) A wireless communication network according to Claim 73, wherein said controller reschedules the demand assigned time slot back to a semi-permanent time slot if the number of the communication links is to be equal to N.

75. (New) A wireless communication network comprising:

a plurality of mobile nodes, each mobile node comprising a phased array antenna and a plurality of transceivers connected thereto so that said phased array antenna simultaneously generates multiple antenna beams, and a controller connected to said plurality of transceivers for scheduling a respective semi-permanent time slot for each time frame to establish a communication link with each neighboring mobile node and leaving at least one available time slot in each time frame,

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand, and

aiming said phased array antenna to multiple neighboring mobile nodes within a scheduled

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semi-permanent time slot.

76. (New) A wireless communication network according to Claim 75, wherein the multiple antenna beams are generated on different frequencies.

77. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a transceiver, a phased array antenna connected to the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node and leaving at least one available time slot in each time frame;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand;

aiming the phased array antenna toward each neighboring mobile node during communication therewith; and

prioritizing the communication links and dropping one of the communication links based upon the prioritization for making available a semi-permanent time slot for establishing a communication link with a new neighboring mobile node.

78. (New) A method according to Claim 77, wherein each time frame has up to N semi-permanent time slots and at least 2N-1 available time slots.

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79. (New) A method according to Claim 77, wherein each node prioritizes the communication links and schedules the at least one available time slot based upon the prioritization.

80. (New) A method according to Claim 77, wherein each mobile node further comprises an omni-directional antenna connected to the transceiver, the method further comprising exchanging positional information with other neighboring mobile nodes.

81. (New) A method according to Claim 77, wherein a plurality of communication links are established within a scheduled semi-permanent time slot, with each communication link including a different pair of neighboring mobile nodes.

82. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a transceiver, a phased array antenna connected to the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node and leaving at least one available time slot in each time frame, and with one of the semi-permanent time slots being scheduled as an available time slot if a number of the communication links is less than N;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand; and

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aiming the phased array antenna toward each neighboring mobile node during communication therewith.

83. (New) A method according to Claim 82, further comprising rescheduling the demand assigned time slot back to a semi-permanent time slot if the number of the communication links is to be equal to N.

84. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a transceiver, a phased array antenna connected to the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node and leaving at least one available time slot in each time frame;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand;

aiming the phased array antenna toward each neighboring mobile node during communication therewith; and

each communication link being formed by an initiating mobile node and a receiving mobile node, and the initiating mobile node transmitting a list of available semi-permanent time slots to said receiving mobile node.

85. (New) A method according to Claim 84, wherein the receiving mobile node transmits selection of one of the semi-permanent time slots to the initiating mobile node.

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86. (New) A method according to Claim 85, wherein the initiating mobile node confirms selection of the selected semi-permanent time slot to the receiving mobile node.

87. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a phased array antenna and a plurality of transceivers connected thereto so that the phased array antenna simultaneously generates multiple antenna beams, and a controller connected to the plurality of transceivers, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node and leaving at least one available time slot in each time frame;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand; and

aiming the phased array antenna to multiple neighboring mobile nodes within a scheduled semi-permanent time slot.

88. (New) A method according to Claim 87, wherein the multiple antenna beams are generated on different frequencies.

89. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a transceiver, a directional antenna connected to

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the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand;

aiming the directional antenna toward each neighboring mobile node during communication therewith; and

prioritizing the communication links and dropping one of the communication links based upon the prioritization for making available a semi-permanent time slot for establishing a communication link with a new neighboring mobile node.

90. (New) A method according to Claim 89, wherein the directional antenna comprises a phased array antenna.

91. (New) A method according to Claim 89, wherein each node prioritizes the communication links and schedules the at least one available time slot based upon the prioritization.

92. (New) A method according to Claim 89, wherein each mobile node further comprises an omni-directional antenna connected to the transceiver, the method further comprising exchanging positional information with other neighboring mobile nodes.

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93. (New) A method according to Claim 89, wherein a plurality of communication links are established within a scheduled semi-permanent time slot, with each communication link including a different pair of neighboring mobile nodes.

94. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a transceiver, a directional antenna connected to the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots, and with one of the semi-permanent time slots being scheduled as an available time slot if a number of the communication links is less than N;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand; and

aiming the directional antenna toward each neighboring mobile node during communication therewith.

95. (New) A method according to Claim 94, further comprising rescheduling the demand assigned time slot back to a semi-permanent time slot if the number of the communication links is to be equal to N.

96. (New) A method for establishing communication

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links for a plurality of mobile nodes, each mobile node comprising a transceiver, a directional antenna connected to the transceiver, and a controller connected to the transceiver, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand;

aiming the directional antenna toward each neighboring mobile node during communication therewith; and

each communication link being formed by an initiating mobile node and a receiving mobile node, and the initiating mobile node transmitting a list of available semi-permanent time slots to the receiving mobile node.

97. (New) A method according to Claim 96, wherein the receiving mobile node transmits selection of one of the semi-permanent time slots to the initiating mobile node.

98. (New) A method according to Claim 97, wherein the initiating mobile node confirms selection of the selected semi-permanent time slot to the receiving mobile node.

99. (New) A method for establishing communication links for a plurality of mobile nodes, each mobile node comprising a phased array antenna and a plurality of transceivers connected thereto so that the phased array

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antenna simultaneously generates multiple antenna beams, and a controller connected to the plurality of transceivers, the method comprising for each mobile node:

scheduling a respective semi-permanent time slot for each time frame to establish a communication link with a neighboring mobile node, each time frame having up to N semi-permanent time slots and at least $2N-1$ available time slots;

scheduling the at least one available time slot to also serve the communication link with a neighboring mobile node based upon link communications demand; and

aiming the phased array antenna to multiple neighboring mobile nodes within a scheduled semi-permanent time slot.

100. (New) A method according to Claim 99, wherein the multiple antenna beams are generated on different frequencies.